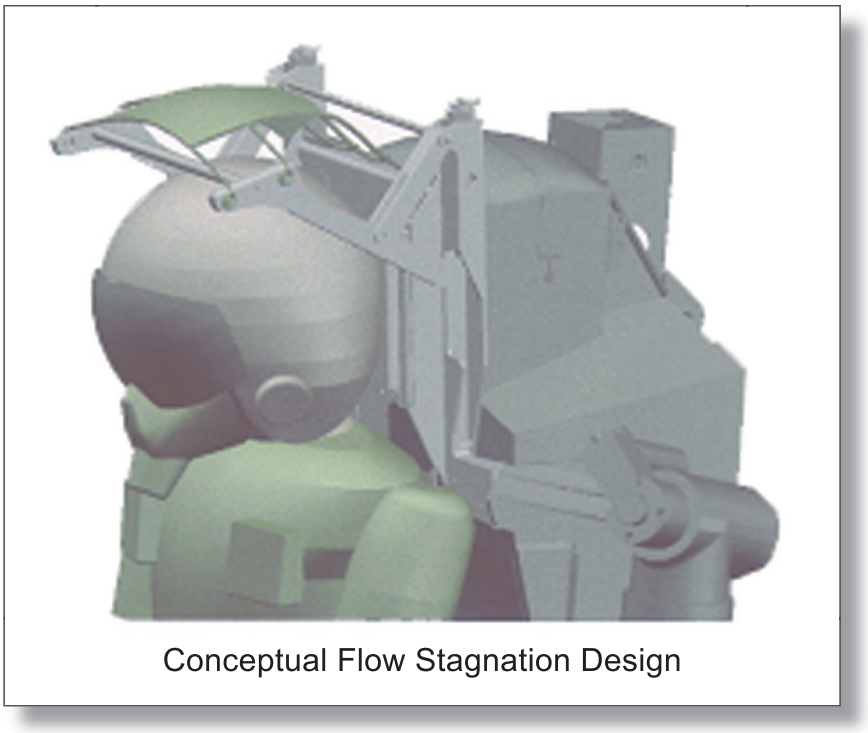
Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

PASSIVE HEAD/NECK PROTECTION SYSTEM REDUCES NECK INJURIES DURING EMERGENCY EJECTIONS



Conceptual Flow Stagnation Design

A new passive head/neck protection system should decrease major injuries and fatalities caused by aerodynamic-induced lift forces in the head/neck area for crewmembers ejecting at airspeeds to 600 knots equivalent air speed (KEAS).

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Accomplishment

The Human Effectiveness Directorate successfully led the development and demonstration of a passive head/neck protection system that deploys during emergency ejection and reduces injurious lift loads acting on the ejection seat occupant's head and neck.

Background

Directorate researchers and contractors from Veridian Engineering developed and demonstrated a seat-mounted flow stagnation design that effectively controls the lift forces on the neck and impact of the head with the headrest during emergency ejections to 600 KEAS. The system is stowed on the ejection seat during normal flight operations and deploys during emergency escape.

Directorate researchers and Veridian Engineering placed emphasis on seat-mounted concepts to avoid crew encumbrance with the addition of aircrew-mounted restraint straps or helmet modifications. The effort has the potential to decrease neck lift forces to non-injurious levels during high-speed ejections for the expanded size and weight range of crewmembers from the small-frame female to the large-frame male.

Human Effectiveness
Support to the Warfighter

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-HE-15)